

Technology Supports for Scholars

A pick-your-path tour for early doctoral students

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Section 1

About Kendall

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What you told us

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Section 3

How fast this is moving

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Section 4

Google Scholar

9 slides

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Content and context

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Section 6

Using AI with care

7 slides

Where it started

THE HIGH-PERFORMANCE TANDY 1000 SX
An Enhanced Version of
America's #1
PC Compatible

NEW FOR 87

2-Disk 384K Tandy 1000 SX

1199⁰⁰
Less
monitor
Low As \$55 Per Month*

- Fifty-Percent Faster Than the IBM® PC
- Ready to Run With Included DeskMate® II Software, Featuring Six Productivity Programs on One Disk
- Software Compatible With the IBM PC Choose From the Most Popular Programs on the Market
- Two Built-In 5 1/4" Disk Drives
- Five Card Slots for Easy Expansion
- Network Compatible
- Built-In Adapters for Monochrome And Color Monitors
- Includes Adapters for a Printer, Joysticks and Light Pen

1000 SX. Since its introduction, the Tandy 1000 went on to become the most IBM PC compatible to hit the market. Now we've made it even better. The 1000 SX is centered around the 8088 microprocessor, ensuring compatibility with industry-standard MS-DOS software. But unlike other "standard" computers, you can run virtually all of your programs one-half times as fast with a 1000 SX. This user-switchable speed is yours when you finish spreadsheets, sort data bases and display intricate graphics faster than ever. To complement this new level of sophistication, the 1000 SX comes with 384K RAM (expandable to 1 megabyte on the main board) and two built-in disk drives. And with five card slots, you can ever to expand your system. Expansion boards are user-installable, and you can choose from memory expansions, internal hard disk, and even a 20-megabyte hard disk card! We've redesigned our DeskMate 6-in-1 applications software to take advantage of the 1000 SX's power, too. DeskMate II for the Tandy 1000 SX features six productivity programs on one disk. And with the special task-switching feature you can exit DeskMate, enter an applications program, then re-enter DeskMate—all with just a few keystrokes (see story, p. 179). With the 1000 SX, the "options" you expect to pay more for are included standard. And color graphics adapters are built in for easy hook-up to a color monitor. Adapters for a printer, joysticks, or light pen are all standard as well. MS-DOS 3.2 system and BASIC. 25-1051

SPECIFICATIONS: Microprocessor: Intel 8088. Clock Speed: 7.16/4.77 Mhz. Operating System: MS-DOS 3.2 with GW-BASIC (Manuals extra). Memory: 384K RAM, expandable to 1 megabyte. Keyboard: 90-key, including numeric-entry keypad. Twelve productivity function keys. Video Display: Optional high-resolution, non-glare 12" monochrome or 13" RGB Color Monitor. 80 or 40 characters per line by 25 lines text, 640 x 200 graphics. Drives: Two 360K (formatted) 5 1/4" mini-floppies. Internal Expansion: Five user-accessible PC-compatible card slots (10" maximum length), 8087 Math-Coprocessor. Extensions: Standard parallel port, composite video out, line level audio out, light pen, joysticks, RGB Color Monitor. AC outlet. Power: 120 VAC, 50/60 Hz.

IBM/Registered TM International Business Machines Corp. MS-DOS/Registered Microsoft Corp.

Hard-Disk Storage Systems

- Choose External or Internal Hard Disk Storage
- Get Fast Access to Volumes of Data

10-Meg Disk System. Expand your Tandy 1000's storage affordably with the Tandy 1000 or 1000 SX, or one to the Tandy 1000 SX (Cable Kit and installation required). Requires Hard Disk Controller Board (25-1025).

Secondary HD Cable Kit for Tandy 1000. 25-1026

Secondary HD Cable Kit for Tandy 1000 HD. 25-1027

New! 20-Meg Hard Disk Card. A complete 20-megabyte hard disk expansion board! User installable. Fits in the Tandy 1000's expansion slot so it doesn't take up any desk space. Also for use in the Tandy 1000 SX. 25-1029

Prices Apply at Participating Radio Shack Stores and Dealers

- Spent Saturday mornings on a TRS-80
- Worked at Radio Shack through high school and college
- Then a high school science teacher in Nebraska
- Now Professor of Educational Technology at UNLV

The Tandy 1000 SX, 1987. 384K of memory, two floppy drives, \$1,199 without a monitor

Still a technology fan



With Leo Laporte on the set of This Week in Tech

- Taught high school science in Bellevue, Nebraska, as Mosaic was introduced
- Research on self-regulated learning, smartphones and learning, online learning, and generative AI in education

Generative AI and my work

- I use these tools most days for writing support, data work, coding, website development, and course design
- I study how to best use technology, and AI in particular, to help people learn
- My default is curious and cautious
- Don't mistake what I say for department, college, or university policy

How to use today

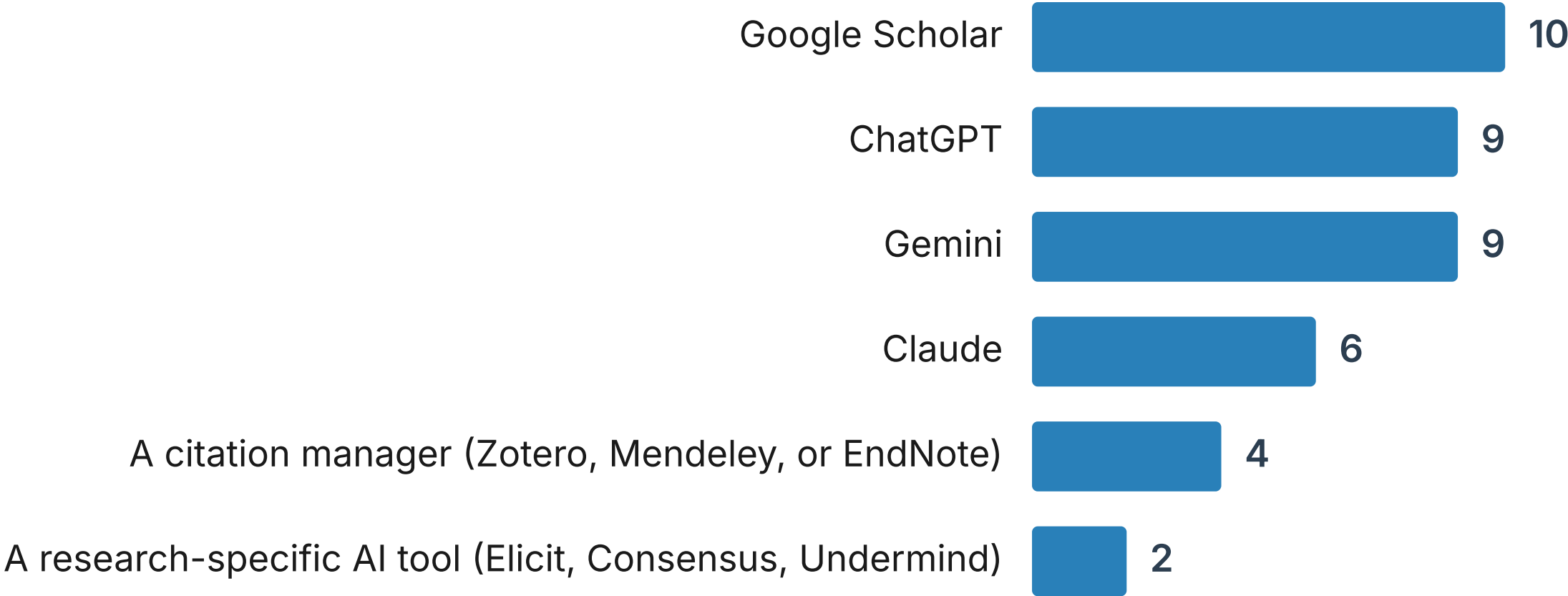
- Every section is a tile on the map
- Each slide has its own link. Bookmark what you want
- The page stays up after today at kendallhartley.com/presentations

Who answered

- 16 of you completed the survey
- Most of you are in coursework, a few are preparing for comprehensive exams

What you already use

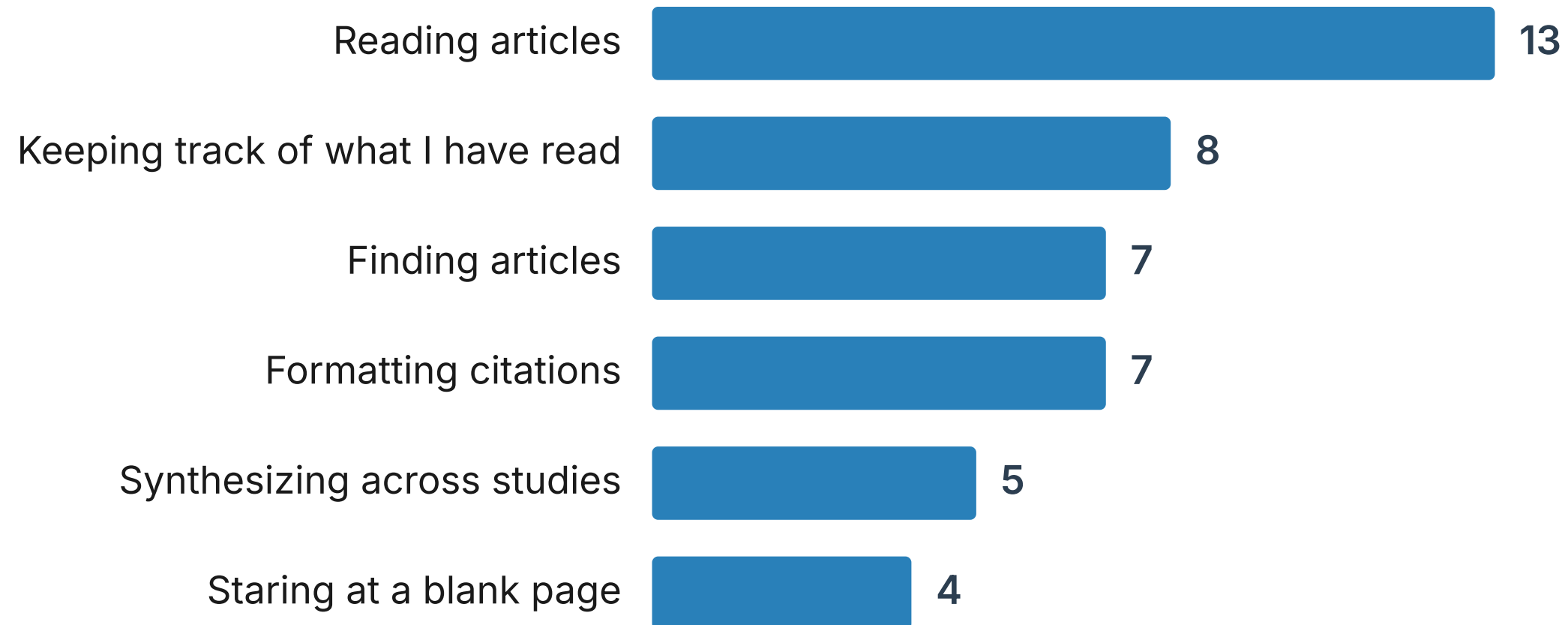
Number of respondents (of 16)



Takeaway General chatbots are already common. Citation managers and research-specific AI tools are not.

Where your time goes

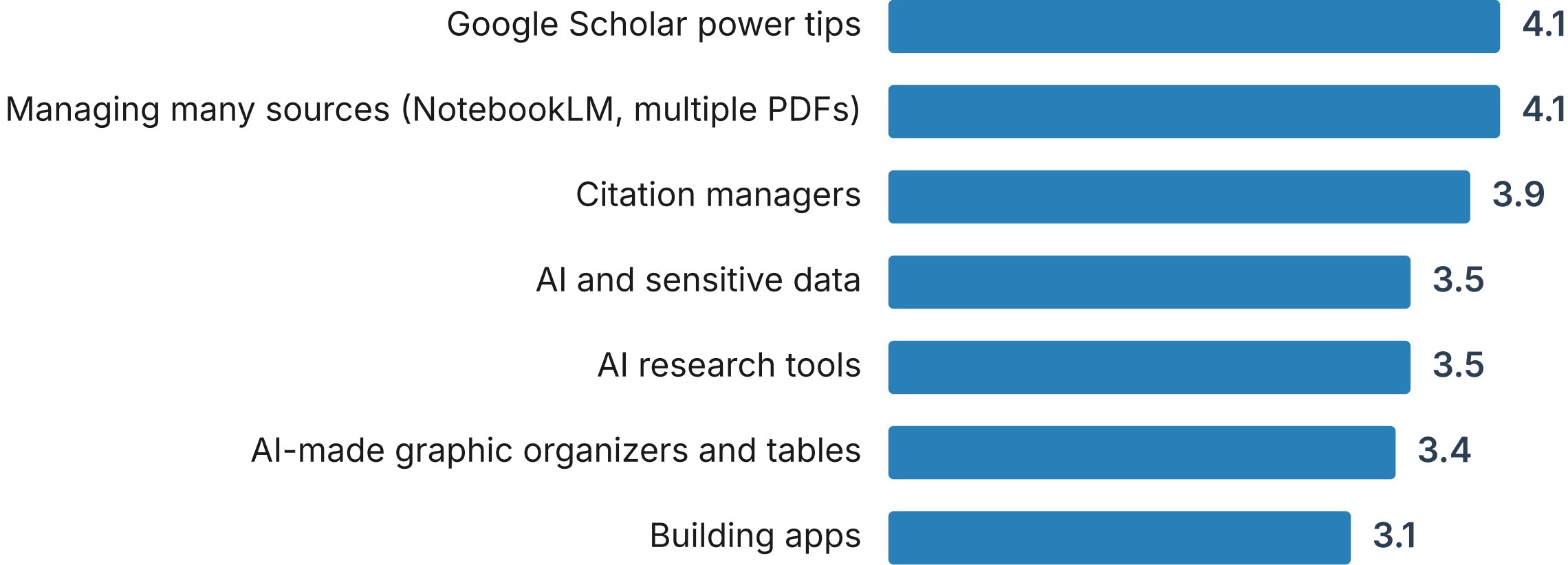
"Where do you lose the most time? Pick up to two." (Most of you picked more than two things.)



Takeaway Reading is the bottleneck for nearly everyone. Remembering what you read is next.

What you want to learn about

"How interested are you in each? (1 = not interested, 5 = very interested)" (Average of your ratings.)

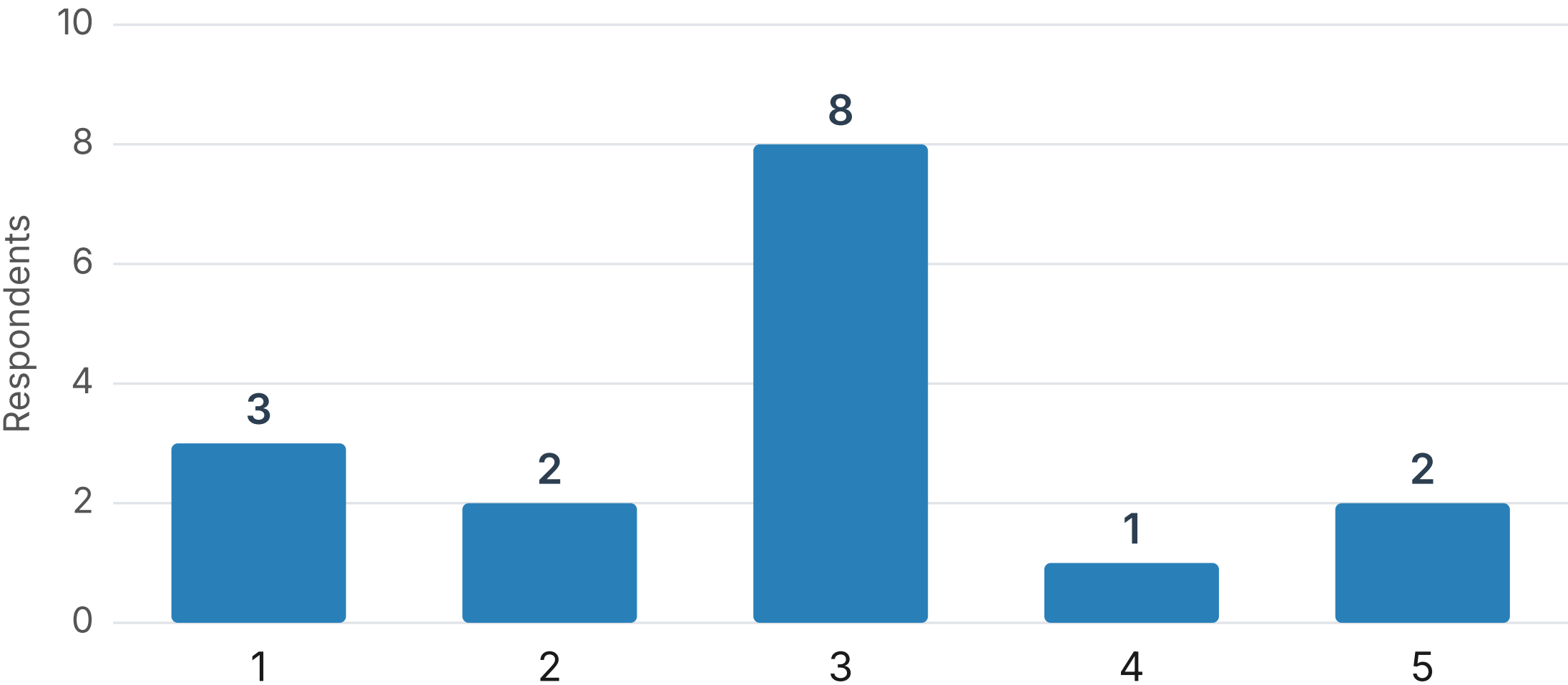


Other requests, paraphrased: AI workflows and prompting, Zotero and its link to Obsidian, non-AI analysis tools

Takeaway The top two became the two deep dives. Citation managers and sensitive data show up in the last section.

How comfortable you are using AI in scholarly work

Number of respondents at each level (1 = not at all, 5 = very)



1 = not at all, 5 = very

Takeaway Average 2.8. High interest, low comfort.

In your words (paraphrased)

- I am not sure what my field thinks about AI
- I worry I will use it the wrong way and get in trouble
- I want to know the appropriate ways to use it
- I have concerns about academic integrity
- The water and energy cost makes me hesitant
- Sometimes it says it did the work when it did not
- I annotate articles but have no good system to find that knowledge later
- I would like to connect Zotero with Obsidian

Technology Adoption Curves

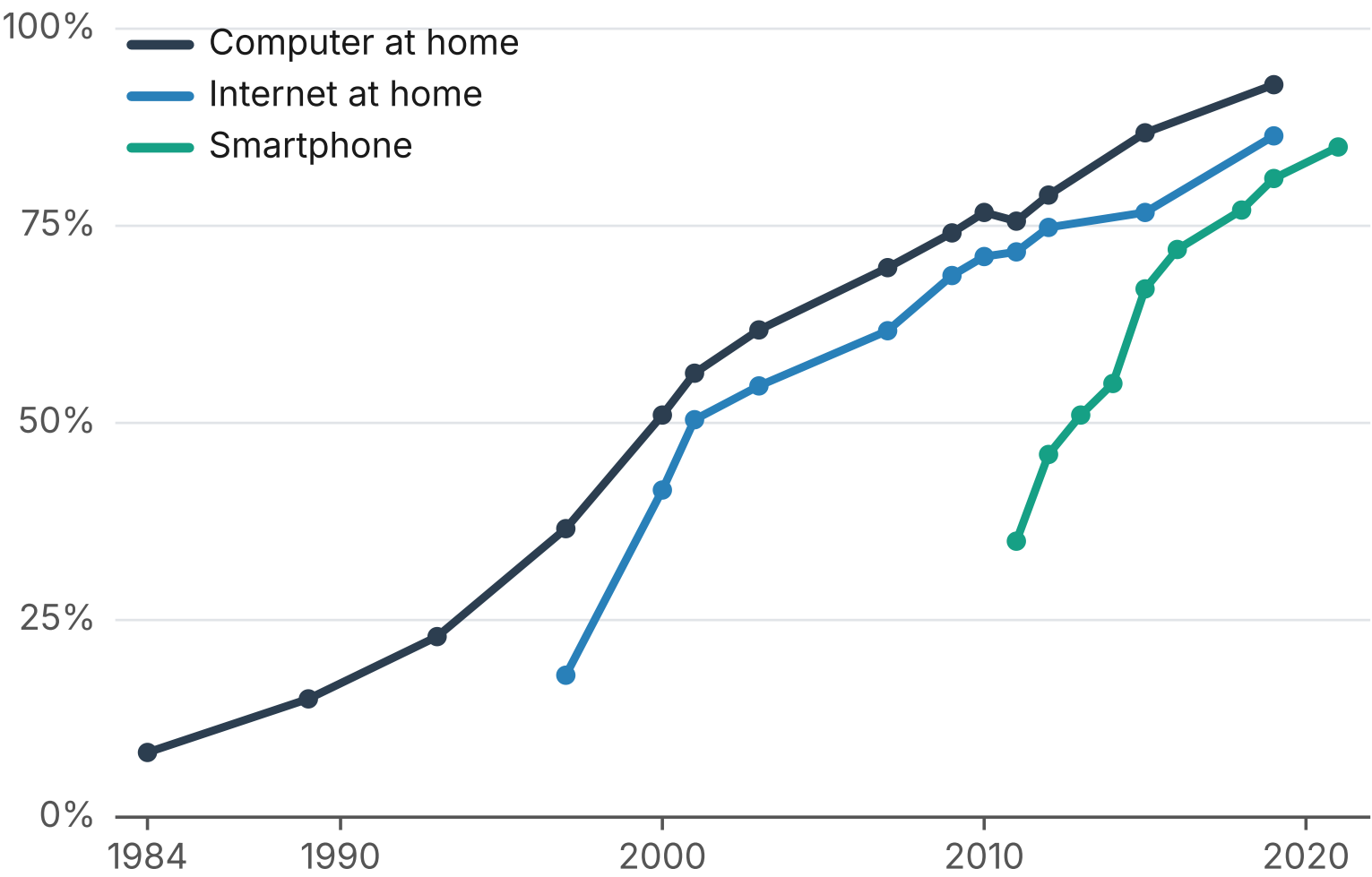
From the home computer to generative AI, 1984 to 2026

Kendall Hartley, Department of Teaching and Learning, University of Nevada, Las Vegas

Where we started, the original table

Households with a computer and Internet use, plus smartphone ownership, 1984 to 2021 (percent).

Year	Computer at home	Internet at home	Smartphone
1984	8.2		
1989	15.0		
1993	22.9		
1997	36.6	18.0	
2000	51.0	41.5	
2001	56.3	50.4	
2003	61.8	54.7	
2007	69.7	61.7	
2009	74.1	68.7	
2010	76.7	71.1	
2011	75.6	71.7	35
2012	78.9	74.8	46
2013			51
2014			55
2015	86.8	76.7	67
2016			72
2018			77
2019	92.9	86.4	81
2021			85



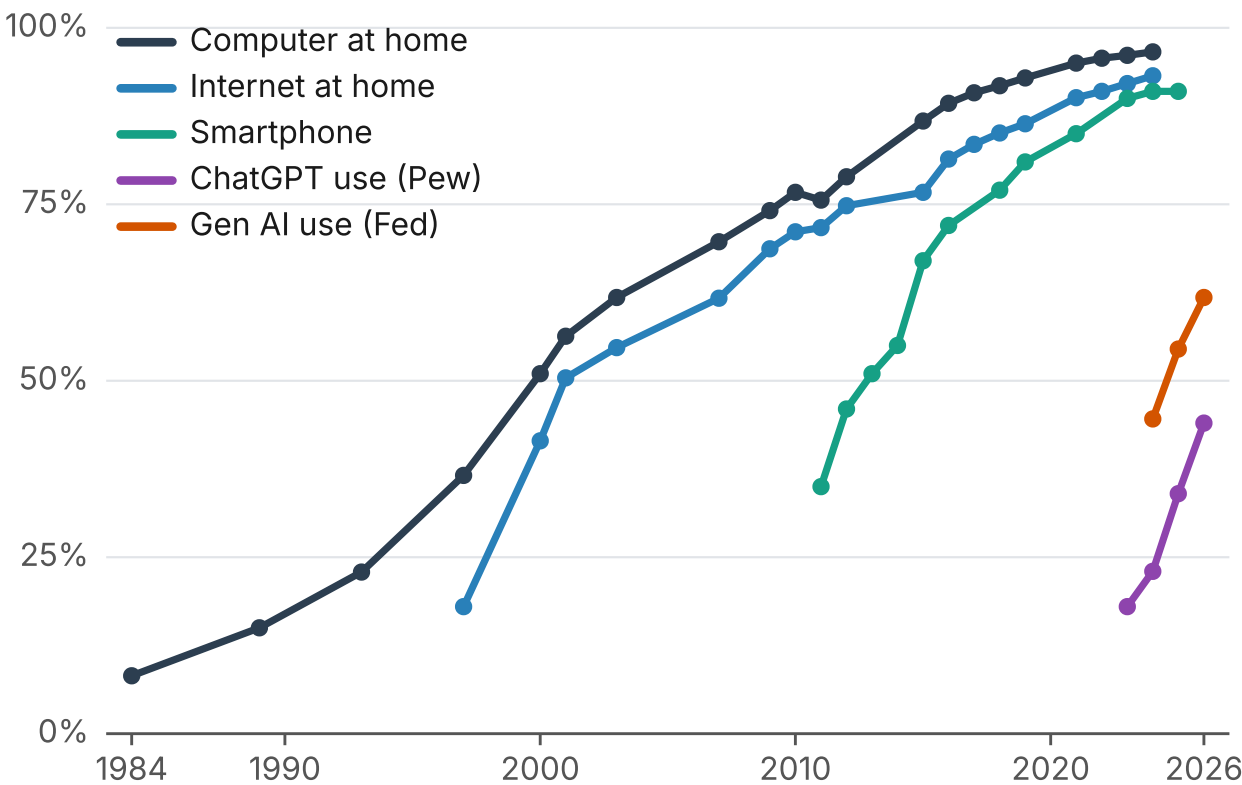
Source: U.S. Census Bureau, Current Population Survey, select years (computer and Internet), and Pew Research Center (smartphone). Values are percents.

Updated through 2026

Five more years of data and two new generative AI measures (new values shaded).

Year	Computer at home	Internet at home	Smartphone	ChatGPT use (Pew)	Gen AI use (Fed)
2013			51		
2014			55		
2015	86.8	76.7	67		
2016	89.3	81.4	72		
2017	90.8	83.5			
2018	91.8	85.1	77		
2019	92.9	86.4	81		
2021	95.0	90.1	85		
2022	95.7	91.0			
2023	96.1	92.1	90	18	
2024	96.6	93.2	91	23	44.6
2025			91	34	54.5
2026				44	61.8

New in the 2026 update. Rows before 2013 are unchanged from the original.

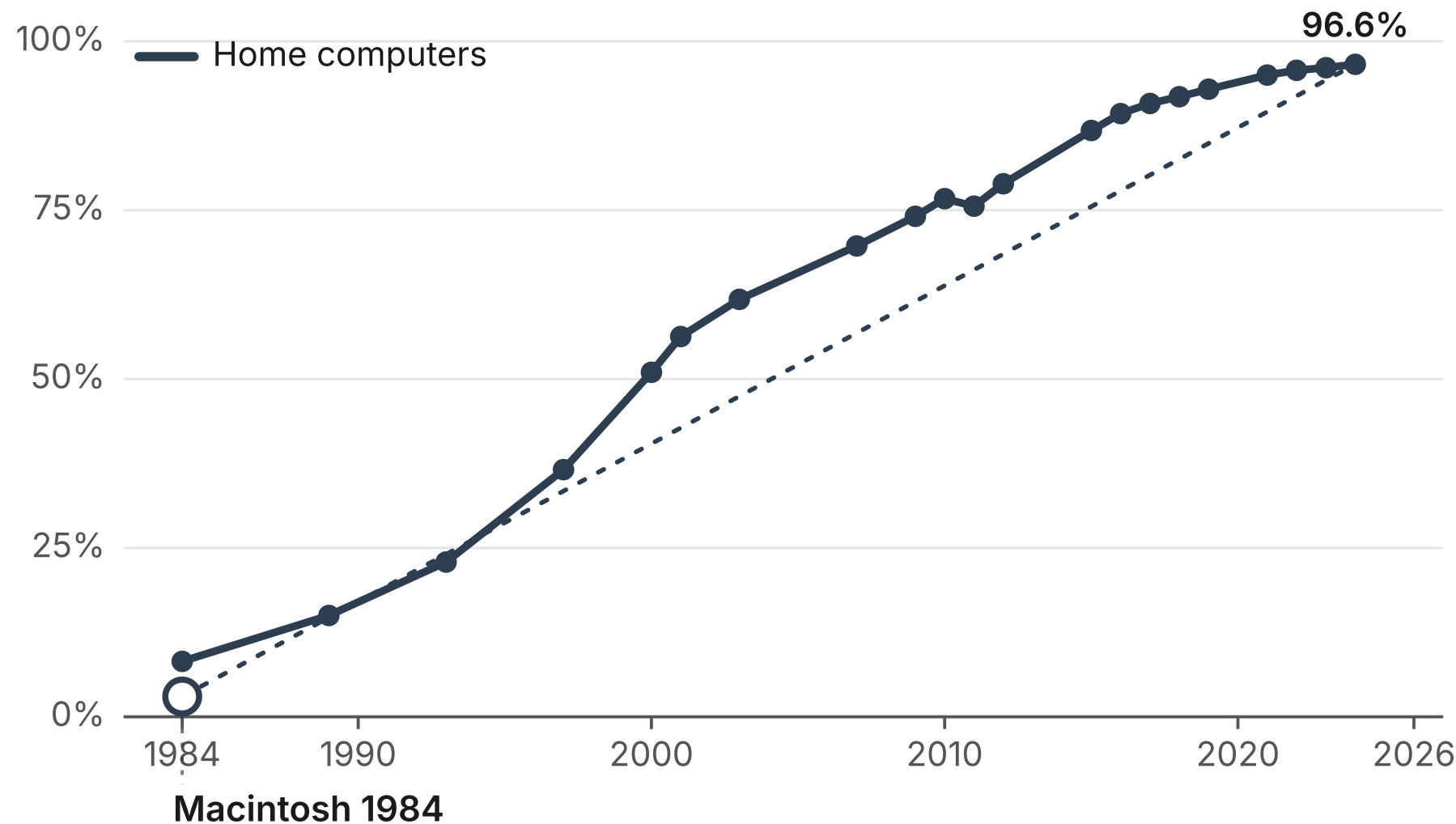


No Census estimates for 2020 or 2025 yet.

Source: U.S. Census Bureau (CPS to 2012, ACS 2015 to 2024), Pew Research Center, St. Louis Fed Real-Time Population Survey. Households for computer and Internet, adults for the rest.

Home computers, a 40-year climb

Households with a computer, from the Macintosh to today



2.3
points per year, 1984 to 2024

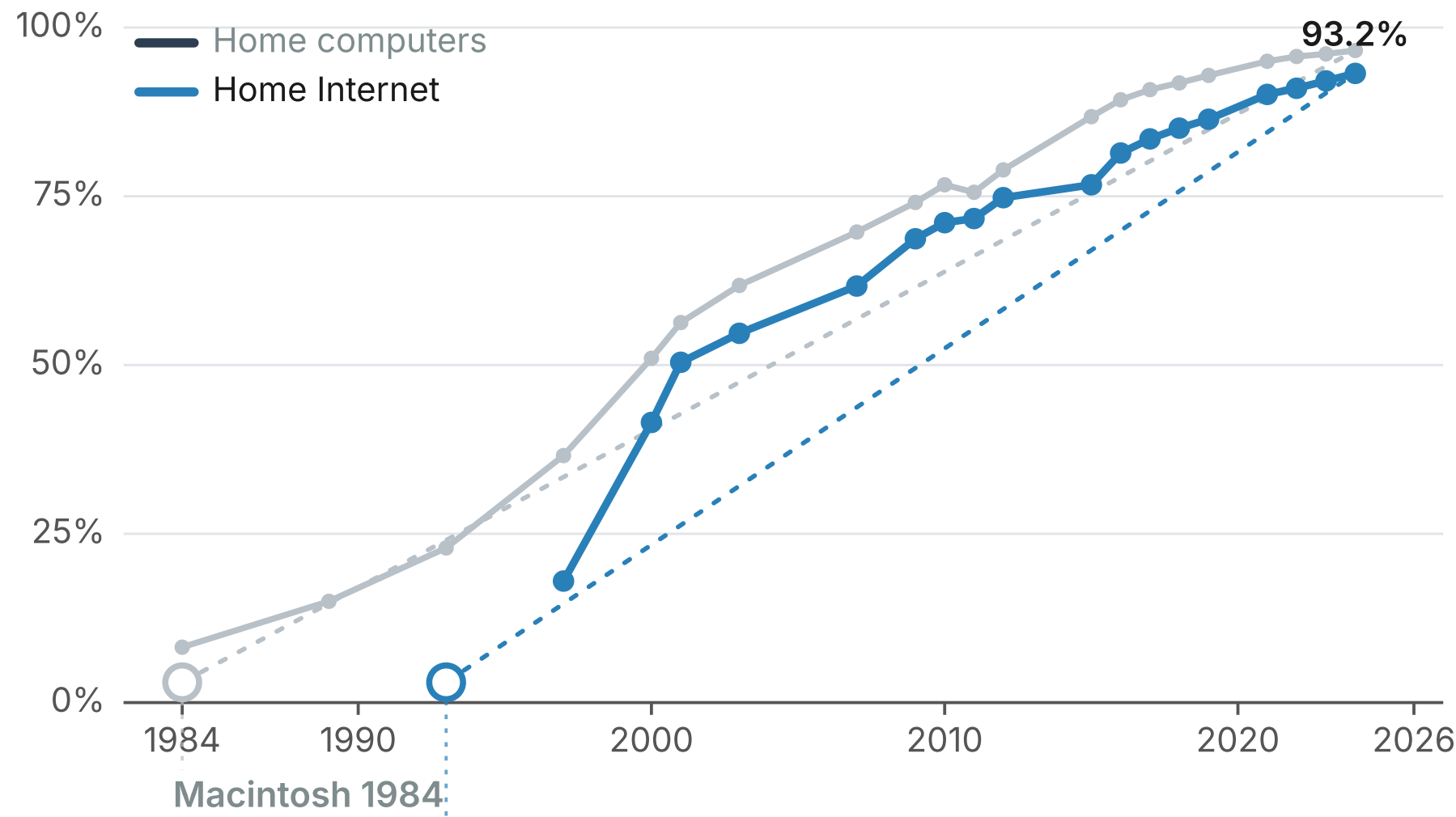
16 years
from the Macintosh to half of households (2000)

In 1984 about 8% of households had a computer. It took until 2000 to pass half of households.

Dotted lines run from each key moment to the latest point on its curve. Households.

Home Internet climbs faster

Adding household Internet use, starting with the Mosaic browser



2.9

points per year, 1993 to 2024

8 years

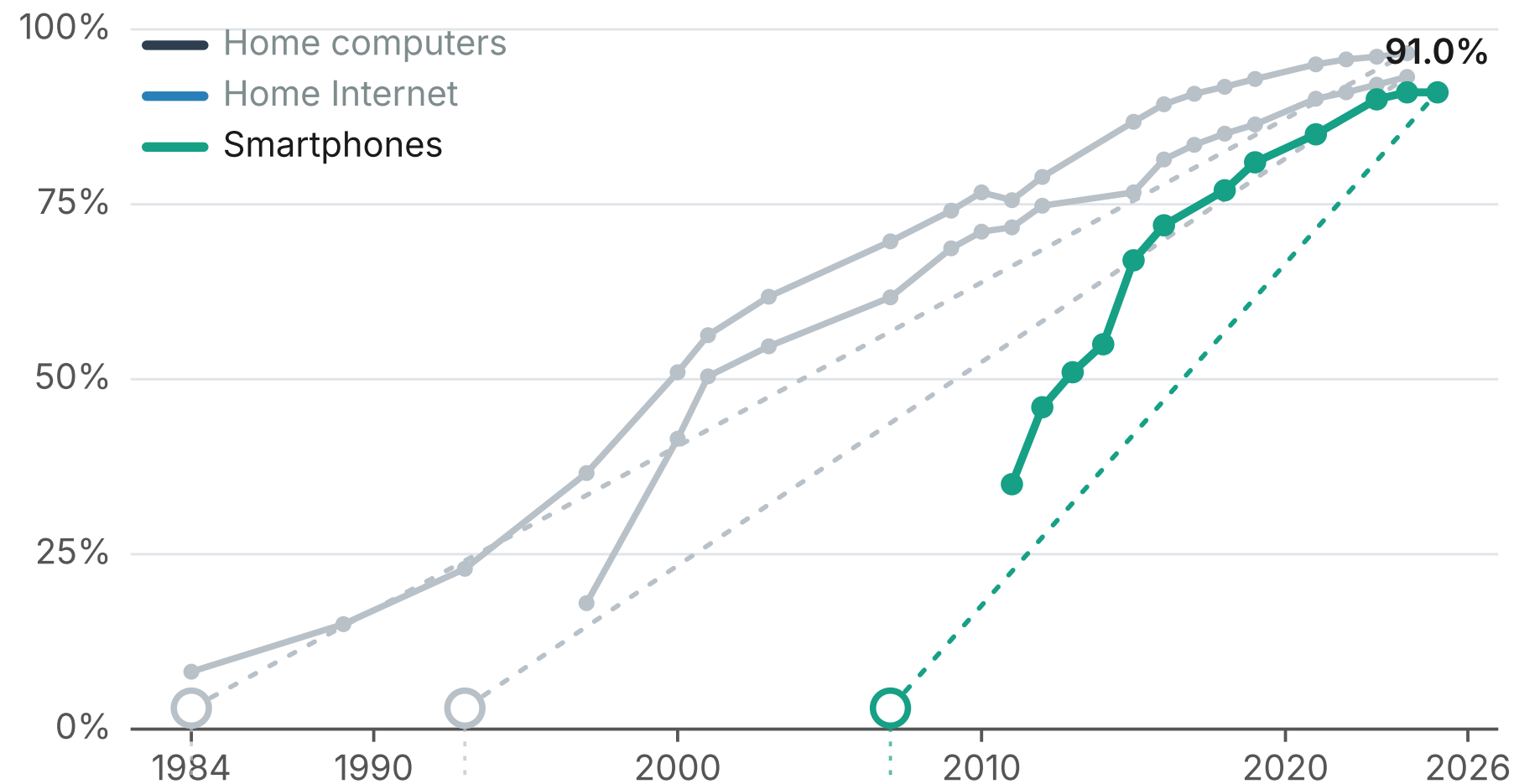
from Mosaic to half of households (2001)

Mosaic appeared in 1993 and Netscape followed in 1994. Half of households were online by 2001.

Dotted lines run from each key moment to the latest point on its curve. Sources: U.S. Census Bureau, Pew Research Center, St. Louis Fed Real-Time Population Survey.

Smartphones compress the curve

Adding adult smartphone ownership, starting with the iPhone



4.9

points per year, 2007 to 2025

6 years

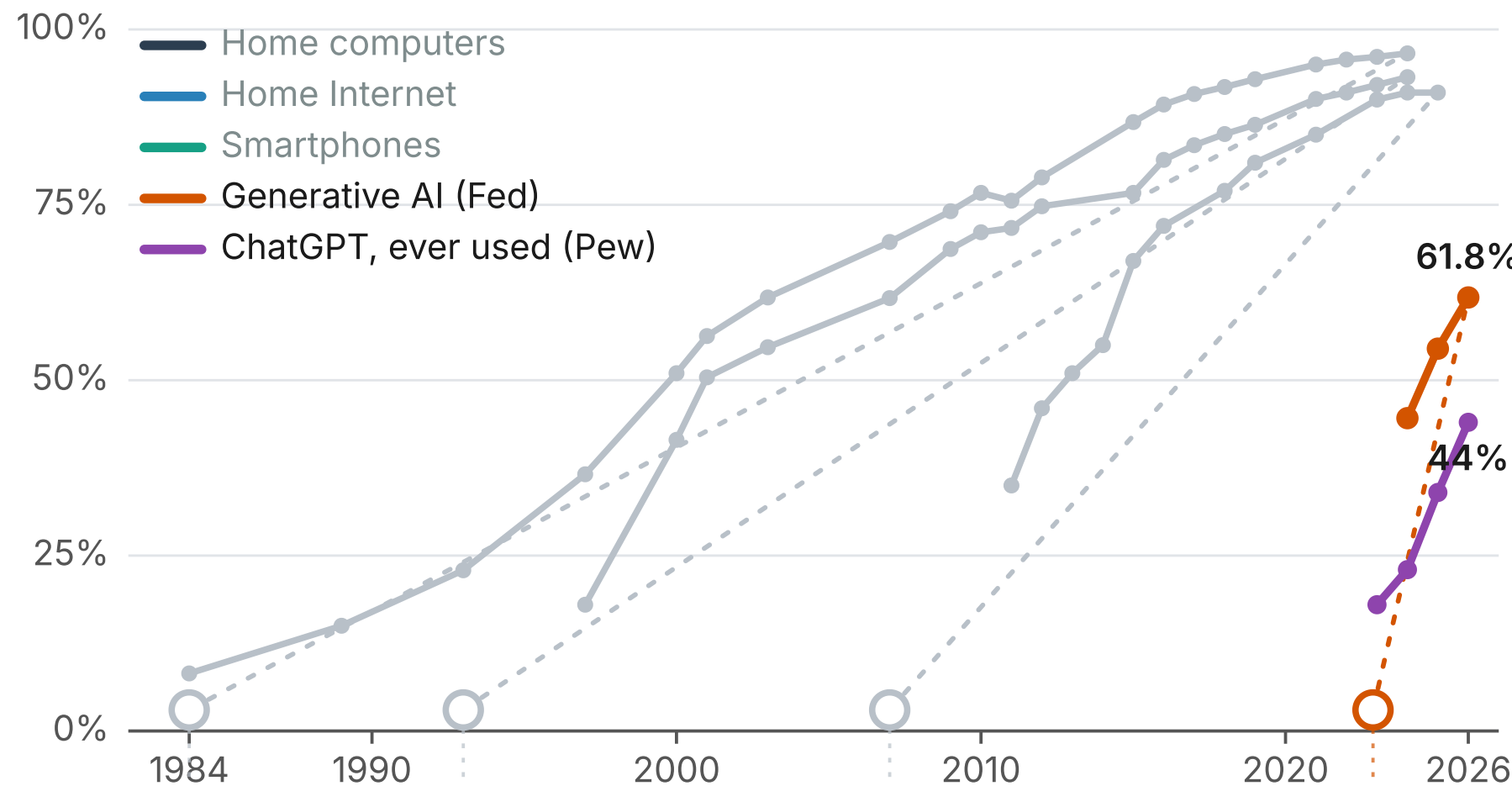
from the iPhone to half of adults (2013)

Social media followed a similar path. Adult use of any social media site went from 7% in 2005 to 50% in 2011, then leveled off near 72%.

Dotted lines run from each key moment to the latest point on its curve. Sources: U.S. Census Bureau, Pew Research Center, St. Louis Fed Real-Time Population Survey.

Generative AI, the steepest curve yet

Adding generative AI use, starting with the public release of ChatGPT



14.7

points per year, 2022 to 2026
(St. Louis Fed)

3 years

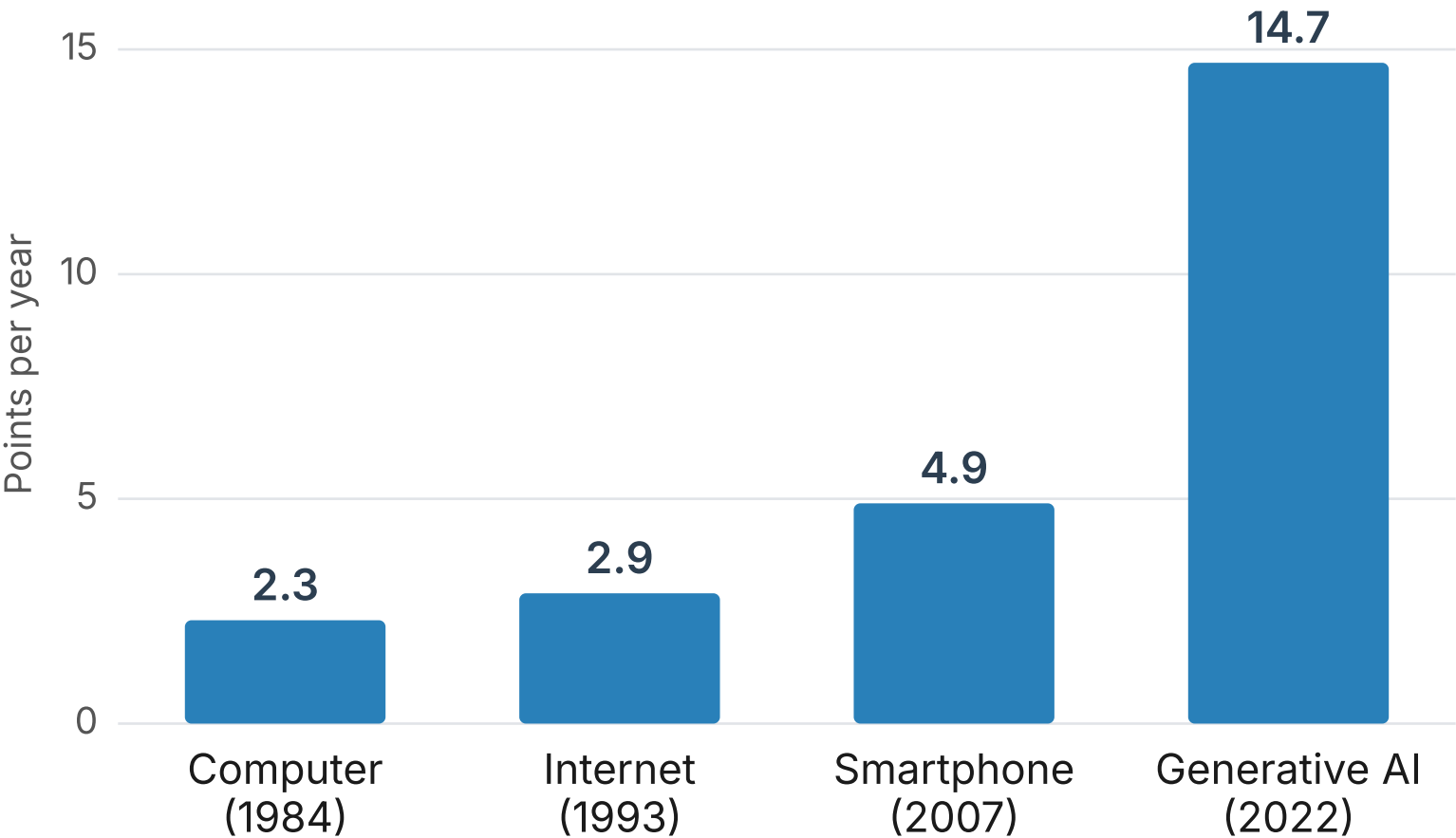
from ChatGPT to half of working-age adults (2025)

Two measures: any generative AI use among adults 18 to 64 (St. Louis Fed), and ever used ChatGPT among all adults (Pew). Even the lower Pew line rises faster than home Internet did.

Dotted lines run from each key moment to the latest point on its curve. Sources: U.S. Census Bureau, Pew Research Center, St. Louis Fed Real-Time Population Survey.

Each new technology climbs faster

Average rise per year from the key moment to the latest data point.



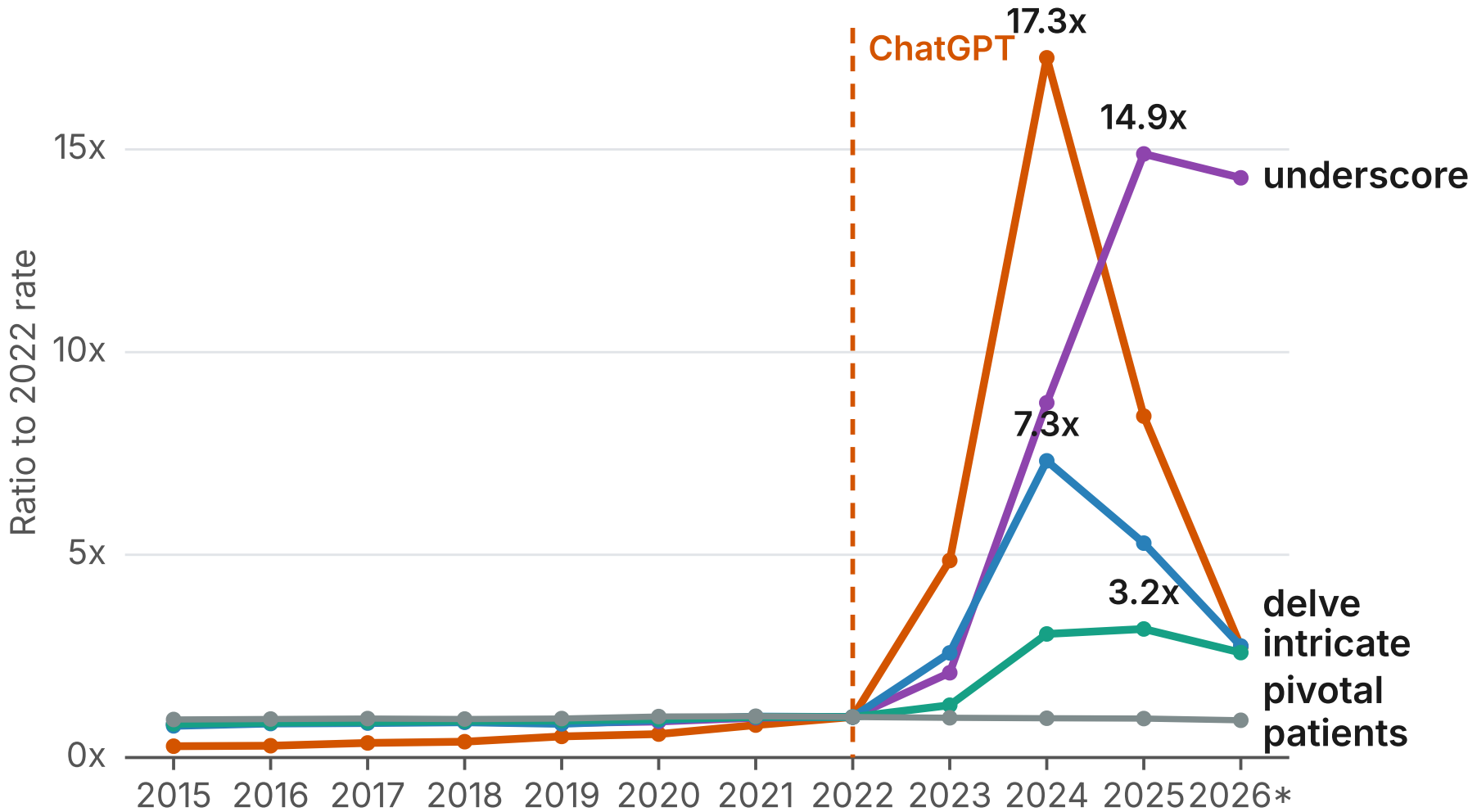
Technology	Key moment	Years to 50%
Home computer	1984	16
Home Internet	1993	8
Smartphone	2007	6
Generative AI	2022	3

The older technologies had decades to level off near 90% or more, which lowers their average slope. Years to 50% gives the same ordering.

Generative AI uses the St. Louis Fed series (adults 18 to 64). Sources: U.S. Census Bureau, Pew Research Center, St. Louis Fed Real-Time Population Survey.

How researchers spot AI writing

Marker words in PubMed abstracts, compared with their 2022 rate.



17x

"delve" in 2024 compared with 2022

15x

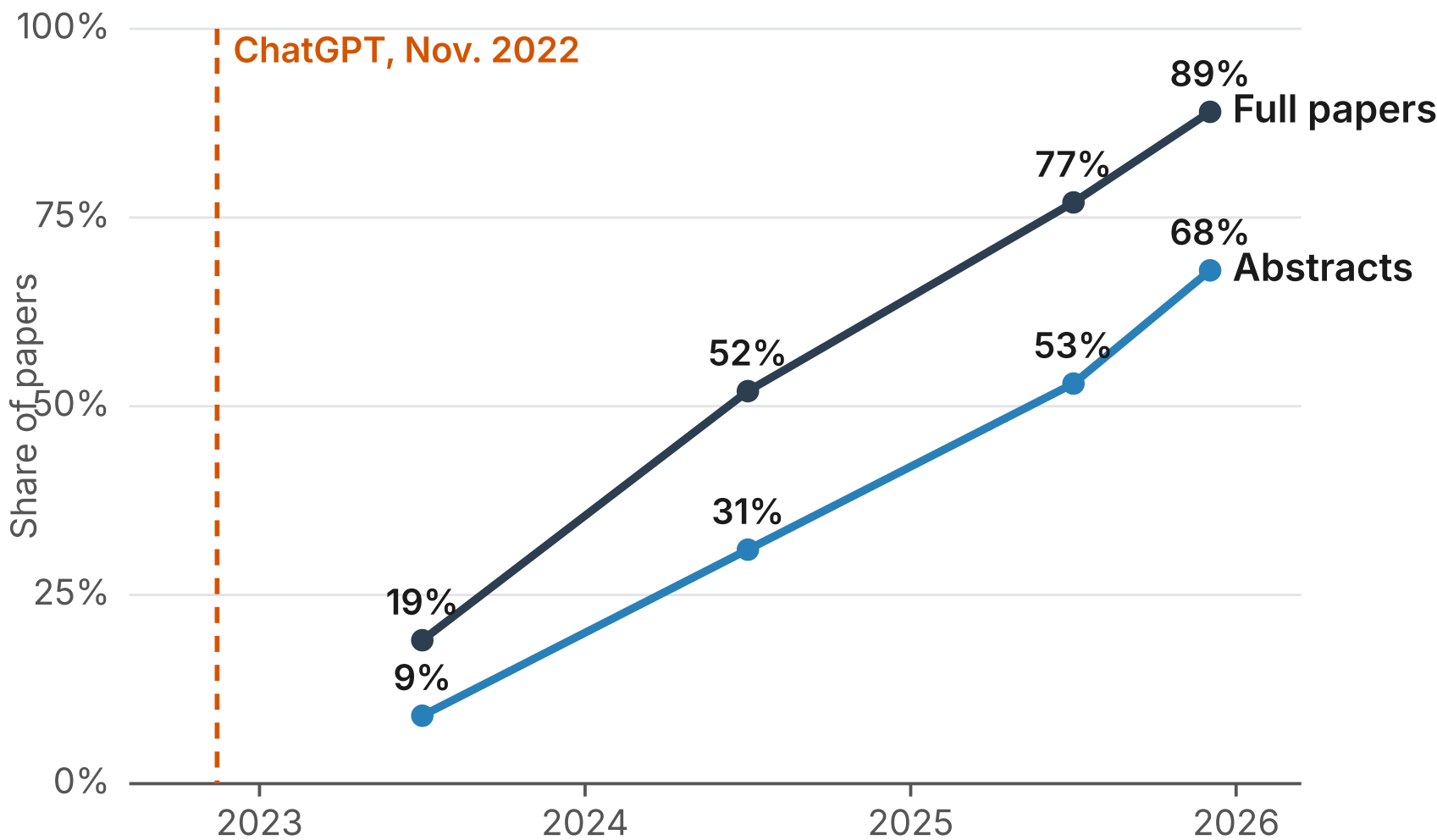
"underscore" in 2025, and still near that level

"Delve" fell back after 2024 once it became a known tell. Detection studies now track hundreds of words at once.

Source: counts from PubMed (NCBI E-utilities), title or abstract, records with abstracts, retrieved Sept. 29, 2026. *2026 is January to September.

Inside scholarship, AI in biomedical papers

Share of PubMed Central papers showing signs of LLM-assisted writing.



89%

of full papers in Dec. 2025, up from 19% in 2023

1 in 40

papers with signs of AI use disclose it (all fields)

Estimates come from shifts in word use and cannot separate light editing from full generation. Still a preprint.

Source: Holzwarth, González-Márquez & Kobak, arXiv 2608.10715 (2026), points plotted at mid-year and Dec. 2025. Disclosure: He & Bu, PNAS (2026).

Initial settings

- Sign in so My Library, alerts, Scholar Labs, and Quick Read work
- Settings, Library links, add UNLV Libraries. Full-text links appear next to results
- Settings, Bibliography manager, choose BibTeX or RefMan for one-click export to Zotero or another manager
- Zotero Chrome plugin is invaluable

Search hacks

- Advanced Search option
- Left sidebar for a date range (Since 2022) and Review articles
- **Cited by** moves forward to newer work that builds on a paper. **Related articles** finds close neighbors
- **All versions** often turns up a free author copy

Journal rankings with Scholar Metrics

1. Menu (top left), then **Metrics**
2. **Top publications** ranks journals and conferences by h5-index
3. Select **View all**
4. Choose a category and subcategory, such as Social Sciences, then Educational Technology
5. Search a journal by name to see where it sits

What the numbers mean

- Higher means more cited, not necessarily better
- Compare journals within a field, never across fields

Article rankings

1. Click a journal's h5-index to see the articles that make it up, most cited first
2. This is a quick way to find the papers everyone in a subfield is citing
3. **Cited by** counts on any result give the same signal for a single article
4. Sort what you find into must-read and skim

Author metrics and alerts

- Author profiles show total citations, h-index, and i10-index, all time and for recent years
- **Follow** an author to get new articles and new citations by email
- **Create alert** on a search or on a key paper's citations
- Start your own profile now

A caution on metrics

- Scholar counts citations broadly (preprints, theses, slides), so its numbers run higher than Scopus or Web of Science
- Citation counts measure attention, not quality
- Ask your chair which journals matter in your area before using any ranking to choose where to submit

AI search inside Scholar

- **Scholar Labs** takes a full research question in plain language, not keywords
- It breaks the question into parts, searches Scholar, and returns papers with a short note on how each one answers the question
- **Quick Read** (new in 2026) gives a structured summary of an article to help decide whether to read it
- Both require signing in

Where AI search falls short

- It returns a limited set of papers and does not support Boolean operators
- Good for finding a starting set, not for a systematic review
- A summary is not a reading. Open the article before you cite it

The problem you described

- Reading takes the most time
- Remembering what you read is the second problem
- Notes end up spread across PDFs, folders, and apps

Context

- Chats, folders, notebooks, and projects
- A notebook built on sources you choose (PDFs, Google Docs, web pages, videos)
- Answers come with citations that point to the passage in your source
- Today's demo is NotebookLM (Google now also calls it Gemini Notebook)
- Similar options at UNLV include Claude projects (free to UNLV students through Rebel Spark AI) and Gemini with uploaded files

NotebookLM in practice

- One notebook per course, project, or comps question
- Ask questions across all sources at once and click each citation to check it
- Generate a study guide, briefing doc, or mind map from your sources
- Audio overviews turn a set of readings into a podcast-style conversation
- Free accounts allow up to 50 sources per notebook, each up to 500,000 words
- Sign in with your UNLV Google account to possibly activate more sources

Questions that work well

- What methods did these studies use, and what were the sample sizes?
- Where do these authors disagree?
- Which of these sources define *construct*, and how?
- What does source 3 say about *topic*? Quote it.
- Build a table comparing purpose, sample, and findings

A system for keeping what you read

- Zotero holds the articles and your annotations
- A notes app (Obsidian, Google Docs, or Notion) holds your own synthesis
- A grounded AI notebook helps you search across both
- ~~Write~~ Say a one-paragraph summary yourself ([Wispr Flow](#), or use [my referral link](#), which gets me a free month)

Where this goes wrong

- It can miss a key point or blend two sources
- It cannot tell you a study is weak
- A summary is not a substitute for reading the articles you will cite
- Use it to decide what to read closely and to find what you already read

Start with the rules that apply to you

- Your syllabus and your instructor
- Your committee and your chair
- The journal or conference you submit to (most now have AI policies)
- UNLV generative AI guidance for students and the Student Academic Integrity Policy (links in 6.7)
- This is a fluid situation. Guidance tomorrow will likely look different than guidance today

Disclose and keep records

- Note which tool you used and for what
- Keep your prompts and drafts for work you submit
- Prepare and plan for a disclosure statement that conforms to your publication outlet. Example: [Hartley, Sáez-Delgado, and Mella-Norambuena, Future Internet, 2026](#)

"During the preparation of this study, the authors used Claude 4.6 for the purposes of developing GenAITutor.net, which was the primary data collection and analysis system. Claude 4.8 was also used to critique methods, analysis, and conclusions and contributed to the final editing process. The authors have reviewed and edited the output and take full responsibility for the content of this publication."

Check everything it claims

- Verify every citation. Look up the article yourself
- Check that a quote actually appears in the source
- If it says it read, ran, or saved something, confirm it did
- Ask it to show its work and point to the source
- Reviewers will punish hallucinations mercilessly

Sensitive data

- Do not upload participant data, identifiable information, or student records to consumer AI tools
- Your IRB protocol governs where research data can go
- UNLV's rule is plain. Never enter FERPA or HIPAA protected data, or personal and sensitive information, into any AI tool, even one covered by a UNLV agreement
- UNLV-supported tools (Claude, Gemini through Rebelmail, ChatGPT, Google AI Pro) keep chats out of model training and away from human review. That is better protection, not permission for sensitive data
- A Freedom of Information Act request may make your prompts front page news

The cost question

- AI use has real energy and water costs ([SemiAnalysis, From Tokens to Burgers](#))
- Reasonable people weigh this differently
- Choosing not to use AI is a legitimate choice for a scholar

Citation managers, quickly

- Only 4 of 16 of you use one
- Zotero is free, works with Word and Google Docs, and grabs citations from the browser
- Pair it with Google Scholar search and the Zotero Chrome plugin
- Zotero connects to Obsidian through community plugins

Resources

- This presentation, kendallhartley.com/presentations
- [UNLV generative AI guidance for students](#)
- [UNLV Student Academic Integrity Policy](#)
- [UNLV AI tools and data protection](#)
- [UNLV AI best practices](#)
- [UNLV Libraries AI 101 guide](#)
- [UNLV Libraries Ask Us](#)
- [UNLV Libraries dissertation and thesis support](#)
- [UNLV Libraries Citation Manager Showdown \(Zotero and others\)](#)
- [UNLV Writing Center AI statement](#)
- [Google Scholar search help](#)
- [Google Scholar Metrics help](#)
- [NotebookLM help](#)
- [Zotero documentation](#)